

REMARKS

Claims 2-3, 7-10, 12-15 and 17-18 are pending in this application. By the Office Action, claims 1-18 are rejected under 35 U.S.C. §103. By this Amendment, claims 1, 4-6, 11, and 16 are canceled. No new matter is added.

I. Rejections Under §103

A. Bouse

Claims 1-2, 4-7, 9, 11-12, 14, and 16-17 are rejected under 35 U.S.C. §103(a) over Bouse. Claims 1, 4-6, 11, and 16 are canceled, rendering their rejection moot. Applicants respectfully traverse the rejection with respect to the remaining claims.

Independent claim 2 is directed to a Ni-base superalloy consisting essentially of: by weight %, Co: 9 to 10%, Cr: 9 to 10%, Mo: 0.5 to 1%, W: 6 to 8%, Al: 4 to 5%, Ti: 4 to 5%, Ta: 2 to 3%, Hf: 0.5 to 2.5%, Re: 1 to 3%, C: 0.05 to 0.1%, B: 0.005 to 0.01%, Zr: up to 0.02%, and the balance of Ni and inevitable impurities. Such a superalloy would not have been obvious over the cited reference.

In support of the rejection, the Office Action cites to Bouse at paragraphs [0006]-[0020] as disclosing alloy compositions that overlap in constituent elements with the claimed superalloy. The Office Action then argues that because the claimed element ranges overlap, the claimed invention would have been obvious. Applicants disagree.

As shown in the Office Action, the claimed element ranges and the disclosed element ranges of Bouse overlap to varying degrees. However, simply showing that the ranges overlap, does not establish that every possible encompassed specific alloy or range of alloys would have been obvious. Rather, the requirements for a *prima facie* case of obviousness are specified and described in MPEP §2143. According to MPEP §2143, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify the reference. Second, there must be a reasonable expectation of success.

Third, the prior art reference must teach or suggest all the claim limitations. In the present case, Bouse fails to teach or suggest all the claim limitations, and provides no reason or rationale for one of ordinary skill in the art to have selected each of the recited elements to be within the claimed ranges so as to practice the claimed invention.

First, as is well known in the art of alloys and superalloys, a composition range of various elements in an alloy is determined based on specific desired properties, uses, and the like of the alloy. Furthermore, as is also well known in the art, the characteristic features and properties of alloys are very sensitive to the kinds and amounts of components included in the alloy. Thus, for example, even minute changes of 1%, 0.1%, or in some cases even 0.01% or less of an element can provide different characteristic features and properties. Even if broad compositional ranges for two asserted alloys overlap each other, the specific alloys formed from elements within the respective broad ranges can and often do have different properties. This is evidenced by the exceedingly broad range of available alloys, each with its own composition and usefulness.

In view of the above, it is understood that when composition ranges of elements of an alloy are given in broad ranges, such as several percent or more, those ranges tend to become meaningless in defining any specific alloy with a specific desired property. This is because while a desired property may be provided when the composition is varied over a small range, that property can in fact change if the specified range is too large. This fact is further exacerbated where the composition is specified using ranges for multiple constituent elements, because while variation in properties can change based on alteration of only one element, those property variations can more dramatically change where the amounts of multiple elements can be altered. Despite this understanding, many of the ranges in Bouse have variations of several percent or more.

Second, in the present case, the Office Action has not cited to a single specific embodiment in Bouse that satisfies all or even most of the claimed ranges. Instead, the Office Action only cites to the broadest disclosure of Bouse in paragraphs [0006]-[0020], and then merely asserts that it would have been obvious to select specific values within the overlapping portions of each of the ranges, to achieve the claimed invention. However, no reason or rationale is provided for one of ordinary skill in the art to have made each and every one of the required selections, to achieve an alloy having each of Co, Cr, Mo, W, Al, Ti, Ta, Hf, Re, C, B, Zr, and Ni within the relatively narrow ranges specified in claim 2.

For example, whereas claim 2 narrowly specifies 9-10% Co and 9-10% Cr, Bouse broadly specifies 5-15% Co and 7-12% Cr. As to Mo, the claimed narrow range of 0.5-1% overlaps only at the endpoint with Bouse's broad range of 1-5. Similar comparisons can be made as to the remaining ranges specified in claim 2 and disclosed in Bouse. However, nowhere does Bouse provide any reason or rationale for one of ordinary skill in the art to have selected Applicants' narrow claimed amounts from the much broader ranges disclosed in Bouse. Clearly, the only possible reason for selecting Applicants' claimed amounts, improperly comes from Applicants' own disclosure and claims, where the Office Action uses Applicants' disclosure and claims as a roadmap.

The courts have clearly held that an assertion of obviousness "can not come from the applicant's invention itself." *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). That is, the motivation for combining the references, or here, selecting specific values from within broad ranges, can not be a product of hindsight reconstruction of the claimed invention based on applicant's own disclosure. Such a hindsight reconstruction has clearly been made in the present Office Action. The Office Action asserts that the claimed invention would have been obvious based on a hindsight selection of the claimed elemental compositions, where the specific claimed values are nowhere specifically suggested to one skilled in the art. Such a

combination is improper because the reference, viewed by itself and not in retrospect, must suggest the combination asserted by the Office Action. *In re Shaffer*, 229 F.2d 476, 108 USPQ 326 (C.C.P.A. 1956); *In re Stoll*, 523 F.2d 1392, 187 USPQ 481 (C.C.P.A. 1975). Here, the only motivation for achieving the claimed invention in the manner asserted in the Office Action derives from the disclosure of the present application, which is improper.

Third, the specific compositions disclosed in Bouse would have led one of ordinary skill in the art away from the claimed invention, not towards it. Despite the broad disclosure at paragraphs [0006]-[0020], Bouse discloses narrower, preferred ranges at paragraphs [0021]-[0048]. In the narrower preferred ranges of Bouse, at least Co, Mo, Ti, Ta, and Hf are present in amounts well outside the ranges of claim 2. Clearly, Bouse provides no reason or rationale for one of ordinary skill in the art to have taken the preferred composition of the reference, and then to have altered not one, not two, not three, not four, but at least five of the component elements to be present in amounts outside the preferred ranges.

Fourth, at least several elements that are required to be present in the claimed superalloy, are indicated as only optional elements in Bouse. Specifically, claim 2 specifies that Hf and Re are absolutely present in amounts of 0.5 to 2.5% and 1 to 3%, respectively. Meanwhile, Bouse only indicates that the elements may be present in amounts up to 2% and 10%, or may not be present at all (i.e., 0%). Again, Bouse provides no reason or rationale to not only specifically require that these elements be present, rather than being absent, but likewise provides no reason or rationale to have them present in the amounts specifically required in claim 2.

For at least these reasons, the claimed invention would not have been obvious over Bouse. Accordingly, the claims are patentable over Bouse. Reconsideration and withdrawal of the rejection are respectfully requested.

B. Cetel

Claims 3, 8, 10, 13, 15, and 18 are rejected under 35 U.S.C. §103(a) over Cetel.

Applicants respectfully traverse the rejection.

Independent claim 3 is directed to a Ni-base superalloy consisting essentially of: by weight %, Co: 10 to 11%, Cr: 10 to 12%, W: 8 to 9%, Al: 4 to 5%, Ti: 4 to 5%, Nb: up to 1%, Hf: 0.5 to 2.5%, C: 0.05 to 0.15%, B: 0.005 to 0.015%, Zr: 0.01 to 0.05%, and the balance of Ni and inevitable impurities. Such a superalloy would not have been obvious over the cited reference.

Like the rejection over Bouse, discussed in detail above, in support of the rejection, the Office Action cites to Cetel at Table 1 as disclosing alloy compositions that broadly overlap in constituent elements with the claimed superalloy. The Office Action then again argues that because the claimed element ranges overlap, the claimed invention would have been obvious. Applicants disagree. For similar reasons as discussed with Bouse, Cetel fails to teach or suggest all the claim limitations, and provides no reason or rationale for one of ordinary skill in the art to have selected each of the recited elements to be within the claimed ranges so as to practice the claimed invention.

Like the rejection of Bouse, the Office Action has not cited to a single specific embodiment in Cetel that satisfies all or even most of the claimed ranges. Instead, the Office Action only cites to the broadest disclosure of Cetel at Table 1, and then merely asserts that it would have been obvious to select specific values within the overlapping portions of each of the ranges, to achieve the claimed invention. However, no reason or rationale is provided for one of ordinary skill in the art to have made each and every one of the required selections, to achieve an alloy having each of Co, Cr, W, Al, Ti, Nb, Hf, C, B, Zr, and Ni within the relatively narrow ranges specified in claim 3.

For example, whereas claim 3 narrowly specifies 10-11% Co and 10-12% Cr, Cetel broadly specifies 4-13% Co and 4-11% Cr. Similar comparisons can be made as to the remaining ranges specified in claim 3 and disclosed in Cetel. However, nowhere does Cetel provide any reason or rationale for one of ordinary skill in the art to have selected Applicants' narrow claimed amounts from the much broader ranges disclosed in Cetel. Clearly, the only possible reason for selecting Applicants' claimed amounts, improperly comes from Applicants' own claims, where the Office Action uses Applicants' disclosure and claims as a roadmap. The Office Action simply asserts that the claimed invention would have been obvious based on a hindsight selection of the claimed elemental compositions, where the specific claimed values are nowhere specifically suggested to one skilled in the art. The only motivation for achieving the claimed invention in the manner asserted in the Office Action derives from the disclosure of the present application, which is improper.

Furthermore, the specific compositions disclosed in Cetel would have led one of ordinary skill in the art away from the claimed invention, not towards it. First, the specific compositions set forth in Table 1 of Cetel are equiaxed, columnar grain, and single crystal materials, which are different from the claimed invention. Second, even in those specific compositions, and despite the broad disclosures of Table 1, Cetel discloses narrower, preferred ranges that differ from the claimed ranges. In the narrower exemplary ranges of Cetel, at least Ti, W, and Zr are present in amounts well outside the ranges of claim 3. Clearly, Cetel provides no reason or rationale for one of ordinary skill in the art to have taken the preferred exemplary compositions of the reference, and then to have altered not one, not two, but at least three of the component elements to be present in amounts outside the stated amounts.

Finally, at least several elements that are required to be present in the claimed superalloy, are indicated as only optional elements in Cetel. Specifically, claim 3 specifies

that Ti, Hf, C, B, and Zr are absolutely present in stated amounts. Meanwhile, Cetel only indicates that the elements may be present in amounts up to a maximum amount, or may not be present at all (i.e., 0%). Again, Cetel provides no reason or rationale to not only specifically require that these elements be present, rather than being absent, but likewise provides no reason or rationale to have them present in the amounts specifically required in claim 3.

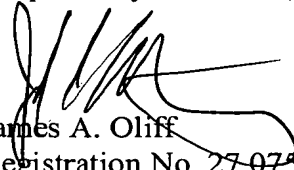
For at least these reasons, the claimed invention would not have been obvious over Cetel. Accordingly, the claims are patentable over Cetel. Reconsideration and withdrawal of the rejection are respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

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